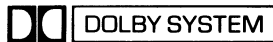


# Service Manual

Cassette Deck  
**RS-616**

Front-Loading Vertical Hold High Fidelity Stereo  
Cassette Deck with Rewind Auto Play System



## RS-631 MECHANISM SERIES

### Specifications (Catalog specifications for sales)

|                        |                                                                           |                    |                                                                                                                        |
|------------------------|---------------------------------------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------|
| Power requirement:     | AC; 110/125/220/240V, 50/60Hz                                             | Fast forward and   |                                                                                                                        |
|                        | Preset power voltage; 220V for Europe, 125V for Asia                      | rewind time:       | Approx. 90 seconds with C-60 cassette tape                                                                             |
|                        | Power consumption; 10W                                                    | Input:             | MIC; sensitivity 0.25 mV, input impedance 10 K $\Omega$ , applicable microphone impedance 400 $\Omega$ ~ 10 K $\Omega$ |
| Motor:                 | Electronic control DC motor                                               |                    | LINE; sensitivity 60 mV, input impedance 56 K $\Omega$                                                                 |
| Track system:          | 4-track 2-channel stereo recording and playback                           | Output:            | LINE; output level 420 mV, load impedance 22 K $\Omega$ over                                                           |
| Tape speed:            | 4.8 cm/s (1-7/8 ips.)                                                     |                    | HEADPHONE; output level 65 mV, impedance 8 $\Omega$                                                                    |
| Wow and flutter:       | 0.07% (WRMS), 0.2% (DIN)                                                  | Rec/pb connection: | 5 P DIN type; input level 8 mV, impedance 5.6 K $\Omega$ , output level 420 mV, impedance 1 K $\Omega$                 |
| Frequency response:    | CrO <sub>2</sub> /FeCr tape; 30 ~ 16,000Hz                                | Bias frequency:    | 90 kHz                                                                                                                 |
|                        | 30 ~ 14,000Hz (DIN)                                                       | Head:              | 2-head system                                                                                                          |
|                        | Normal tape; 30 ~ 14,000Hz                                                |                    | 1-LH head for record/playback                                                                                          |
|                        | 30 ~ 13,000Hz (DIN)                                                       |                    | 1-double-gap ferrite head for erasure                                                                                  |
| Signal-to-noise ratio: | Dolby* NR in; 66 dB (above 5 kHz)                                         | Dimensions:        | 46 cm(W) $\times$ 15 cm(H) $\times$ 27.1 cm(D)<br>[18"(W) $\times$ 6"(H) $\times$ 10-3/4"(D)]                          |
|                        | Dolby NR out; 56 dB                                                       | Weight:            | 5.2 kg (11 lbs 8 oz)                                                                                                   |
|                        | (signal level = max. recording level, FeCr or CrO <sub>2</sub> type tape) |                    |                                                                                                                        |

Specifications are subject to change without notice.

\* 'Dolby' and the double-D symbol are trademarks of Dolby Laboratories.

# Technics

Panasonic Tokyo  
Matsushita Electric Industrial Co., Ltd.  
17-15, 6-chome, Shinbashi, Minato-ku, Tokyo 105 Japan

Matsushita Electric Trading Co., Ltd.  
P.O. Box 288, Central Osaka Japan

# LOCATION OF CONTROLS AND COMPONENTS

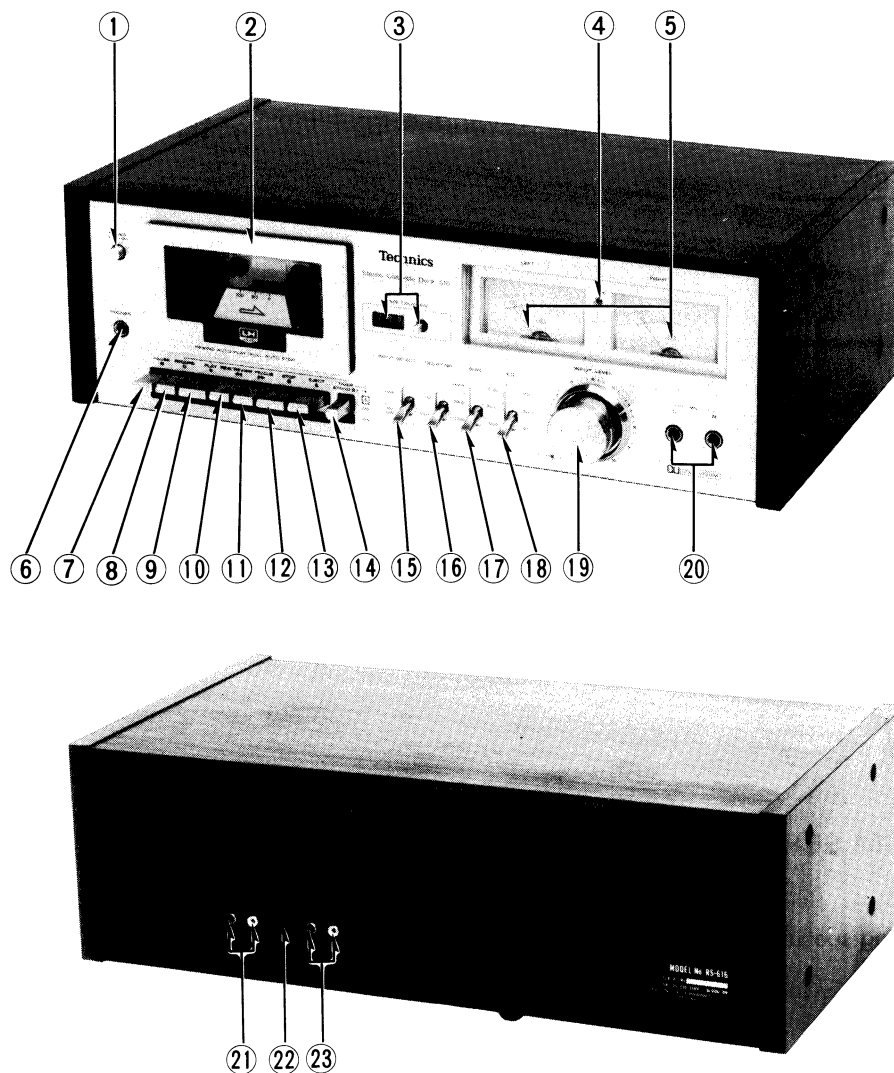


Fig. 1

- |                                 |                                     |
|---------------------------------|-------------------------------------|
| ① Power switch                  | ⑬ Eject button                      |
| ② Cassette compartment door     | ⑭ Timer stand-by button             |
| ③ Tape counter and reset button | ⑮ Input selector                    |
| ④ Recording indication lamp     | ⑯ Dolby noise-reduction switch      |
| ⑤ Level meters                  | ⑰ Bias selector                     |
| ⑥ Headphones jack               | ⑱ Equalization selector             |
| ⑦ Pause button                  | ⑲ Input level controls              |
| ⑧ Record button                 | ⑳ Microphone jacks                  |
| ⑨ Play button                   | ㉑ Line output jacks                 |
| ⑩ Rewind/review button          | ㉒ Record/playback connection socket |
| ⑪ Fast forward/cue button       | ㉓ Line input jacks                  |
| ⑫ Stop button                   |                                     |

# DISASSEMBLY INSTRUCTIONS

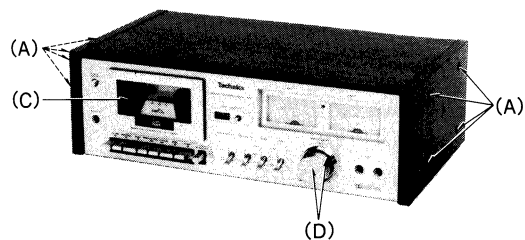


Fig. 2

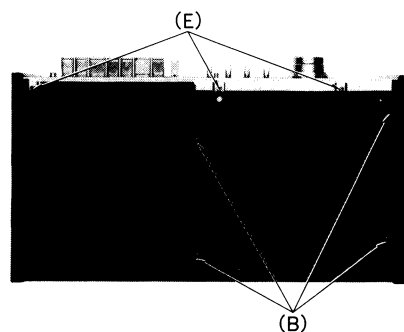


Fig. 3

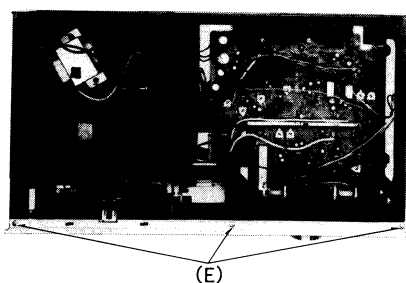


Fig. 4

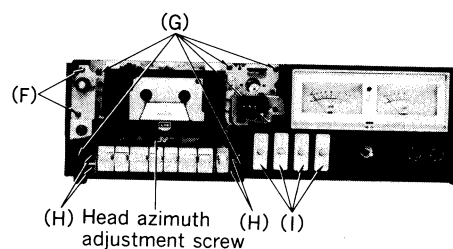


Fig. 5

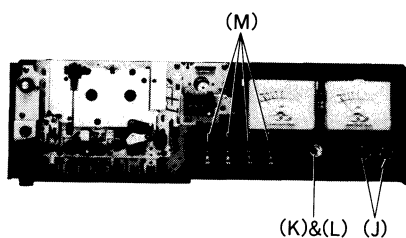


Fig. 6

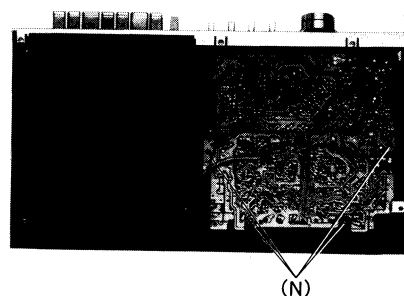


Fig. 7

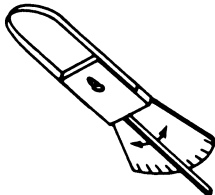
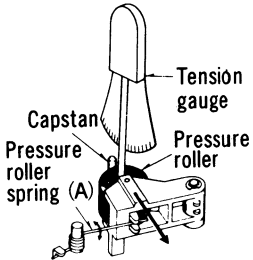
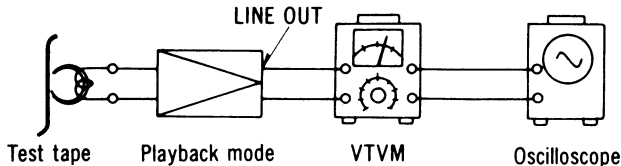
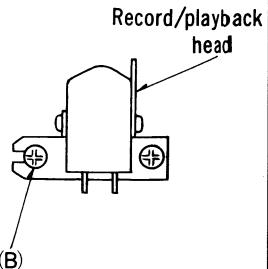
| Procedure | To remove — .                             | Remove — .                                                                                                                      | Pcs.                     | Shown in fig. — .     |
|-----------|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------|
| 1         | Case cover                                | • Screws ..... (A)                                                                                                              | 8                        | 2                     |
| 2         | Bottom cover                              | • Screws ..... (B)                                                                                                              | 4                        | 3                     |
| 3         | Front panel                               | • Cassette lid ..... (C) ※<br>• Control knobs ..... (D)<br>• Screws ..... (E)                                                   | 1<br>2<br>6              | 2<br>2<br>3, 4        |
| 4         | Mechanism                                 | • Screws ..... (F)<br>• Red screws ..... (G)                                                                                    | 2<br>6                   | 5<br>5                |
| 5         | Operation button unit and cassette holder | • Screws ..... (H)                                                                                                              | 4                        | 5                     |
| 6         | Circuit board                             | • Switch shelters ..... (I)<br>• Nuts ..... (J)<br>• Nuts and washer ..... (K), (L)<br>• Screws ..... (M)<br>• Screws ..... (N) | 4<br>2<br>1, 1<br>4<br>4 | 5<br>6<br>6<br>6<br>7 |

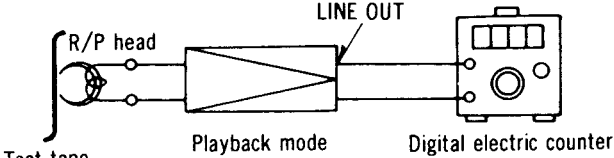
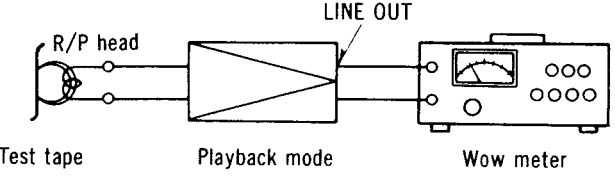
※The head azimuth can be adjusted by removing the cassette lid (C).

# MEASUREMENT AND ADJUSTMENT METHOD

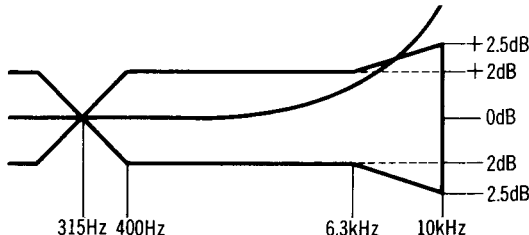
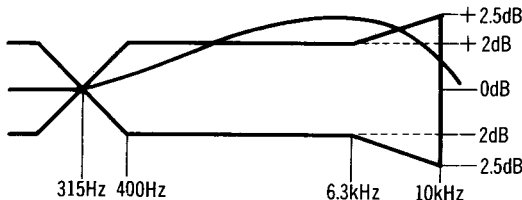
## NOTE:

1. Make sure heads are clean.
2. Make sure capstan and pressure roller are clean.
3. Judgeable room temperature:  $20 \pm 5^\circ\text{C}$  ( $68 \pm 9^\circ\text{F}$ ).
4. Dolby NR switch: OUT.
5. Bias selector: LOW.
6. Equalizer selector:  $120\mu\text{S}$ .

| ITEM                                                                                                                                                                                    | MEASUREMENT & ADJUSTMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | REMARKS                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| <b>Pressure of pressure roller</b><br>Equipment:<br>* Tension gauge (max. 500 gr)<br><br><b>Fig. 8</b> | <ol style="list-style-type: none"> <li>1. Place UNIT into playback mode.</li> <li>2. Hook the tension gauge to pressure roller lever and pull it in the direction of the arrow as shown in fig. 9.</li> <li>3. Measure the tension at the moment when the pressure roller moves away from the capstan.</li> </ol> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>Standard value: <math>400 \pm 50</math> gr</b> </div><br><b>Adjustment method</b><br>Bend the part (A) of the pressure roller spring in either direction shown by the arrow until the correct pressure is attained.                                              | * Playback mode<br><br><b>Fig. 9</b>    |
| <b>Takeup tension</b><br>Equipment:<br>* Cassette torque meter<br>... QZZSRKCT                                                                                                          | <ol style="list-style-type: none"> <li>1. Mount cassette torque meter on UNIT.</li> <li>2. Place UNIT into playback mode and read takeup torque.</li> <li>3. Measure several times and determine the mean value.</li> </ol> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>Standard value: <math>50 \pm 20</math> gr-cm</b> </div>                                                                                                                                                                                                                                                                                                | * Playback mode                                                                                                            |
| <b>Head azimuth adjustment</b><br>Equipment:<br>* VTVM<br>* Oscilloscope<br>* Test tape (azimuth)<br>... QZZCFM                                                                         | <b>Record/playback head adjustment</b><br><ol style="list-style-type: none"> <li>1. Test equipment connection is shown below.</li> </ol> <div style="text-align: center;">  <br/> <b>Fig. 10</b> </div> <ol style="list-style-type: none"> <li>2. Play azimuth tape (QZZCFM 8kHz).</li> <li>3. Adjust record/playback head angle adjustment screw (B) in fig. 11 so that output level at LINE OUT becomes maximum.</li> <li>4. Measure both channels, and adjust levels for equal output.</li> <li>5. After adjustment lock head adjustment screw with lacquer.</li> </ol> | * Playback mode<br><br><b>Fig. 11</b> |

| ITEM                                                                                                                                                                                     | MEASUREMENT & ADJUSTMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | REMARKS                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| <p><b>Tape speed</b></p> <p>Equipment:</p> <ul style="list-style-type: none"> <li>* Digital electronic counter or frequency counter (RP8067)</li> <li>* Test tape ... QZZCWAT</li> </ul> | <p><b>Tape speed accuracy</b></p> <p>1. Test equipment connection is shown below.</p>  <p style="text-align: center;"><b>Fig. 12</b></p> <p>2. Play test tape (QZZCWAT 3,000Hz), and supply playback signal to frequency counter.</p> <p>3. Measure this frequency.</p> <p>4. On the basis of 3,000Hz, determine value by following formula:</p> $\text{Tape speed accuracy} = \frac{f - 3,000}{3,000} \times 100 (\%)$ <p style="text-align: center;">where, f = measured value</p> <p>5. Take measurement at middle section of tape.</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto; width: fit-content;"> <b>Standard value: <math>\pm 1.5\%</math></b> </div> <p><b>Adjustment method</b></p> <ol style="list-style-type: none"> <li>1. Play the test tape (middle).</li> <li>2. Adjust so that frequency becomes 3,000Hz.</li> <li>3. Tape speed adjustment VR shown in fig. 28.</li> </ol> <p><b>Tape speed fluctuation</b></p> <p>Make measurements in same manner as above (beginning, middle and end of tape), and determine difference between maximum and minimum values and calculate as follows:</p> $\text{Tape speed fluctuation} = \frac{f_1 - f_2}{3,000} \times 100 (\%)$ <p style="text-align: center;">f<sub>1</sub> = maximum value<br/>f<sub>2</sub> = minimum value</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto; width: fit-content;"> <b>Standard value: 1%</b> </div> | <p>* Playback mode</p> |
| <p><b>Wow and flutter</b></p> <p>Equipment:</p> <ul style="list-style-type: none"> <li>* Wow meter</li> <li>* Test tape ... QZZCWAT</li> </ul>                                           | <p>1. Test equipment connection is shown below.</p>  <p style="text-align: center;"><b>Fig. 13</b></p> <p>2. Use wow test tape (3,000Hz) and measure its playback signal on wow meter.</p> <p>3. Wow and flutter is expressed in percentage and that measurement can be weighted by JIS network (WRMS).</p> <p>4. Measure at middle section of test tape.</p> <div style="border: 1px solid black; padding: 5px; text-align: center; margin: 10px auto; width: fit-content;"> <b>Standard value: 0.07% (WRMS)</b> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <p>* Playback mode</p> |

| ITEM                                                                                                                                                                   | MEASUREMENT & ADJUSTMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | REMARKS                |               |       |        |               |               |               |               |                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------|-------|--------|---------------|---------------|---------------|---------------|------------------------|
| <p><b>Playback frequency response</b></p> <p>Equipment:</p> <ul style="list-style-type: none"><li>* VTVM</li><li>* Oscilloscope</li><li>* Test tape ... C-FH</li></ul> | <div><div><div>1. Test equipment connection is as same as "Head azimuth adjustment" but use the test tape (QZZCFM) instead of head azimuth tape (See fig. 10).</div><div>2. Place UNIT into playback mode.</div><div>3. Play frequency response test tape.</div><div>4. Measure output level at 8 kHz, 4 kHz, 1 kHz, 315 Hz, 250 Hz, 125 Hz and 63 Hz and compare output level with standard frequency 315 Hz, at LINE OUT.</div><div>5. Make measurement for both channels.</div><div>6. Make sure that the measured value is within the range specified in the frequency response chart.</div></div><div><p>Playback frequency response chart</p><p>Fig. 14</p></div></div> | <p>* Playback mode</p> |               |       |        |               |               |               |               |                        |
| <p><b>Playback frequency response</b></p>                                                                                                                              | <div><p><b>Adjustment</b></p><div><div>1. If the measured value decreases at high frequency range, as shown in fig. 15, P.C.B. connection points (B) should be shorted to increase at high frequency range (See fig. 18 on page 7).</div><div><p>Fig. 15</p><p>The corrected value</p><table><tr><td>4 kHz</td><td>6 kHz</td><td>8 kHz</td><td>10 kHz</td></tr><tr><td>about +0.1 dB</td><td>about +0.4 dB</td><td>about +0.7 dB</td><td>about +1.2 dB</td></tr></table></div></div></div>                                                                                                                                                                                    | 4 kHz                  | 6 kHz         | 8 kHz | 10 kHz | about +0.1 dB | about +0.4 dB | about +0.7 dB | about +1.2 dB | <p>* Playback mode</p> |
| 4 kHz                                                                                                                                                                  | 6 kHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 8 kHz                  | 10 kHz        |       |        |               |               |               |               |                        |
| about +0.1 dB                                                                                                                                                          | about +0.4 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | about +0.7 dB          | about +1.2 dB |       |        |               |               |               |               |                        |

| ITEM                                                                                                                                                       | MEASUREMENT & ADJUSTMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | REMARKS                |                  |       |        |                |                  |                  |                  |       |       |       |       |                  |                  |                  |                  |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|------------------|-------|--------|----------------|------------------|------------------|------------------|-------|-------|-------|-------|------------------|------------------|------------------|------------------|--|
|                                                                                                                                                            | <p>2. If the measured value increases at high frequency range, as shown in fig. 16, P.C.B. connection points (A) should be unsoldered and connection points (B) should be shorted (See fig. 18 on page 7).</p> <div></div> <p style="text-align: center;"><b>Fig. 16</b></p> <p style="text-align: center;">The corrected value</p> <table><tr><td>4 kHz</td><td>6 kHz</td><td>8 kHz</td><td>10 kHz</td></tr><tr><td>about<br/>-0 dB</td><td>about<br/>-0.2 dB</td><td>about<br/>-0.4 dB</td><td>about<br/>-0.8 dB</td></tr></table> <p><b>Caution:</b><br/>Please do not unsolder both connection points (A), (B) to prevent oscillation.</p> <p>3. If the measured value increases at middle frequency range, as shown in fig. 17, P.C.B. connection points (C) should be shorted (See fig. 18 on page 7).</p> <div></div> <p style="text-align: center;"><b>Fig. 17</b></p> <p style="text-align: center;">The corrected value</p> <table><tr><td>1 kHz</td><td>2 kHz</td><td>4 kHz</td><td>6 kHz</td></tr><tr><td>about<br/>-0.3 dB</td><td>about<br/>-0.7 dB</td><td>about<br/>-0.8 dB</td><td>about<br/>-0.8 dB</td></tr></table> | 4 kHz                  | 6 kHz            | 8 kHz | 10 kHz | about<br>-0 dB | about<br>-0.2 dB | about<br>-0.4 dB | about<br>-0.8 dB | 1 kHz | 2 kHz | 4 kHz | 6 kHz | about<br>-0.3 dB | about<br>-0.7 dB | about<br>-0.8 dB | about<br>-0.8 dB |  |
| 4 kHz                                                                                                                                                      | 6 kHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 8 kHz                  | 10 kHz           |       |        |                |                  |                  |                  |       |       |       |       |                  |                  |                  |                  |  |
| about<br>-0 dB                                                                                                                                             | about<br>-0.2 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | about<br>-0.4 dB       | about<br>-0.8 dB |       |        |                |                  |                  |                  |       |       |       |       |                  |                  |                  |                  |  |
| 1 kHz                                                                                                                                                      | 2 kHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 4 kHz                  | 6 kHz            |       |        |                |                  |                  |                  |       |       |       |       |                  |                  |                  |                  |  |
| about<br>-0.3 dB                                                                                                                                           | about<br>-0.7 dB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | about<br>-0.8 dB       | about<br>-0.8 dB |       |        |                |                  |                  |                  |       |       |       |       |                  |                  |                  |                  |  |
| <p><b>Playback gain</b></p> <p>Equipment:</p> <ul style="list-style-type: none"><li>* VTVM</li><li>* Oscilloscope</li><li>* Test tape ... QZZCFM</li></ul> | <p>1. Test equipment connection is shown in fig. 10.</p> <p>2. Play standard recording level portion on test tape (QZZCFM 315 Hz), and using VTVM measure the output level at LINE OUT jack.</p> <p>3. Make measurement for both channels.</p> <div style="border: 1px solid black; padding: 5px; text-align: center;"><b>Standard value: 0.42V (-7 dB)</b></div> <p><b>Adjustment</b></p> <p>1. If measured value is not standard, adjust VR1 (L-CH), VR2 (R-CH) (See fig. 28 on page 12).</p> <p>2. After adjustment, check "Playback frequency response" again.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <p>* Playback mode</p> |                  |       |        |                |                  |                  |                  |       |       |       |       |                  |                  |                  |                  |  |

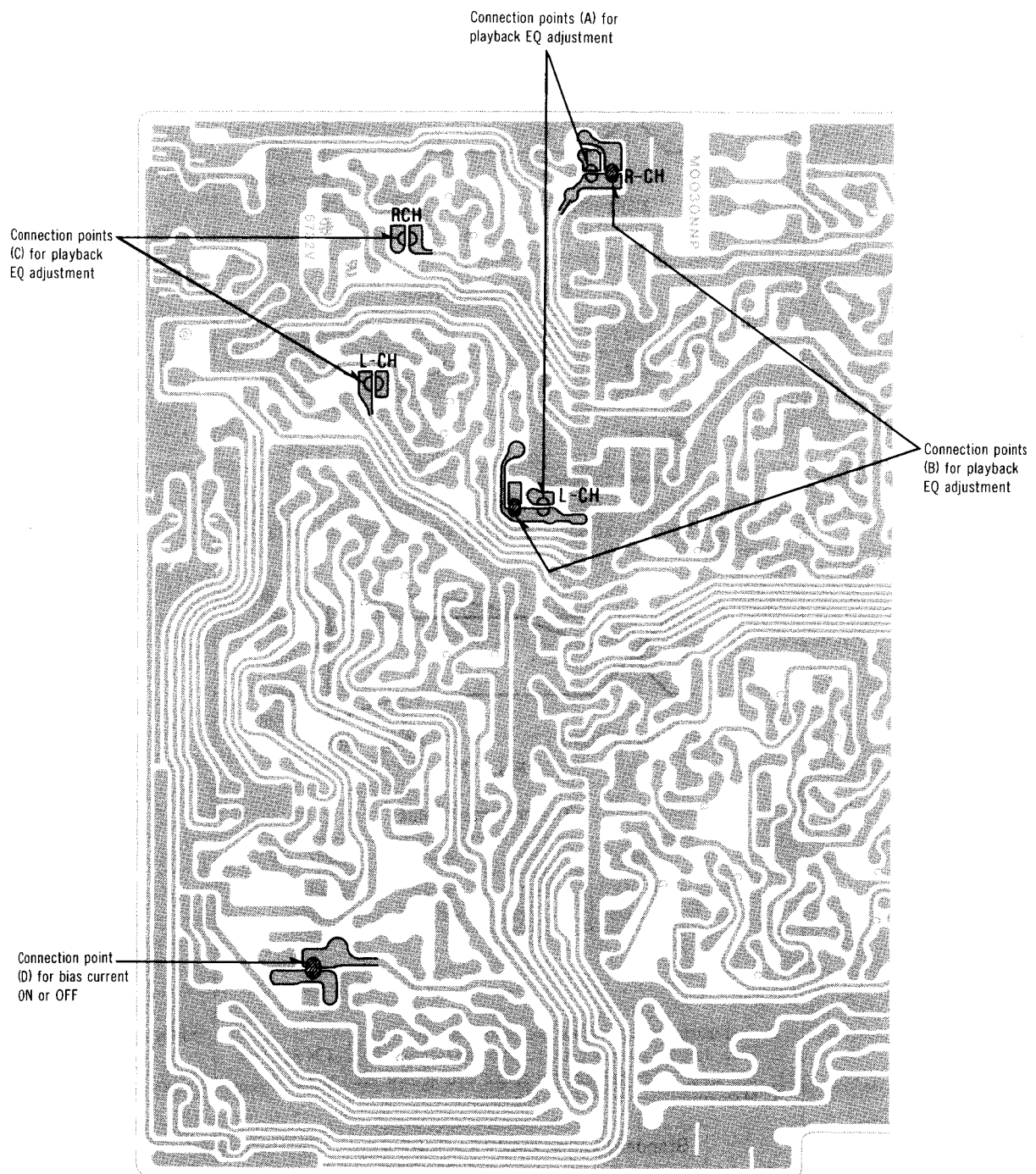
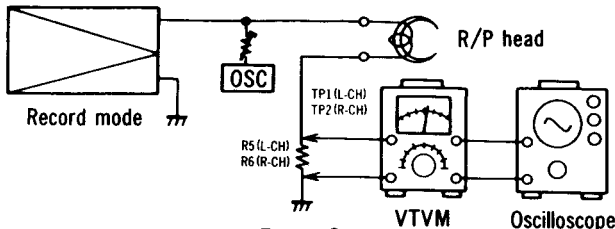
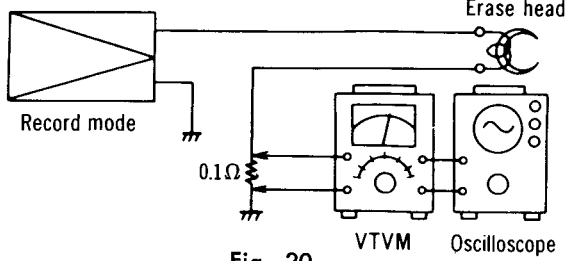
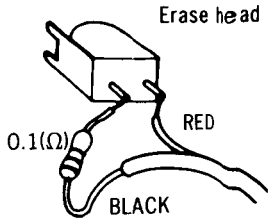
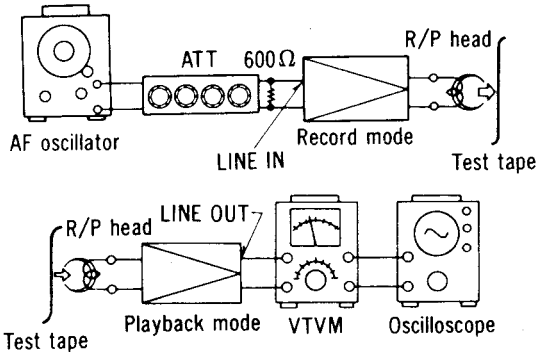
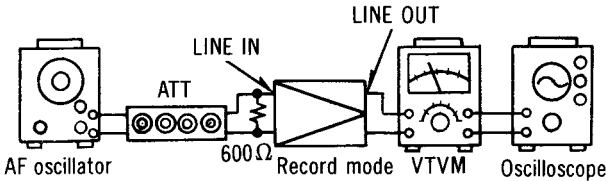
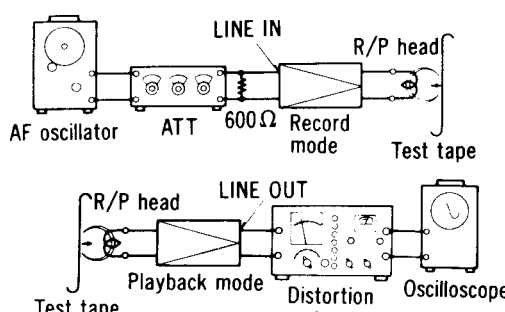
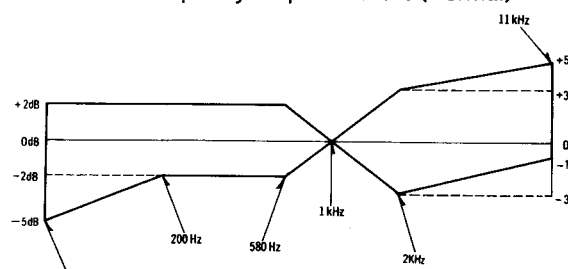
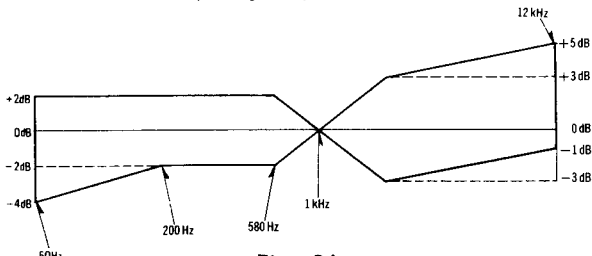
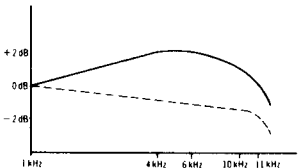


Fig. 18

| ITEM                                                                                                              | MEASUREMENT & ADJUSTMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | REMARKS                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Playback S/N ratio</b><br>Equipment:<br>* VTVM<br>* Oscilloscope<br>* Test tape ... QZZCFM<br>* Empty cassette | <ol style="list-style-type: none"> <li>Test equipment connection is shown in fig. 10.</li> <li>Play standard recording level test tape (QZZCFM 315Hz) and read output level on VTVM.<br/>Refer to "Playback gain adjustment".</li> <li>Place empty cassette (which has been cut) and play again.</li> <li>Measure noise level at this time using VTVM, and determine ratio of this level to test tape output signal voltage (315Hz).</li> </ol> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <b>Standard value: Greater than 43dB</b> </div> <p>An example calculation is shown below.</p> <p>A: Es = playback output signal voltage of test tape (315Hz)<br/>           B: En = playback output noise level<br/>           Es = 0.42 V (−7 dB)<br/>           En = 0.003 V (−50 dB)</p> $S/N \text{ ratio} = \frac{E_s}{E_n} = \frac{0.42 \text{ V}}{0.003 \text{ V}} = 140$ $20 \log_{10} 140 = 43 \text{ dB}$ $S/N \text{ ratio} = E_s(\text{dB}) - E_n(\text{dB}) = -7 - (-50) = 43 \text{ dB}$                                      | * Playback mode                                                                                                                                                                                                                                         |
| <b>Bias current</b><br>Equipment:<br>* VTVM<br>* Oscilloscope                                                     | <ol style="list-style-type: none"> <li>Test equipment connection is shown below.</li> </ol>  <p style="text-align: center;"><b>Fig. 19</b></p> <ol style="list-style-type: none"> <li>Place UNIT into record mode, and bias selector to "LOW".</li> <li>Read voltage on VTVM and calculate bias current by following formula:</li> </ol> $\text{Bias current (A)} = \frac{\text{Value read on VTVM (V)}}{10 (\Omega)}$ <div style="border: 1px solid black; padding: 10px; margin: 10px auto; width: fit-content;"> <p><b>Standard value:</b></p> <p>250 <math>\begin{matrix} +130\mu\text{A} \\ -80\mu\text{A} \end{matrix}</math> (LOW position)</p> <p>275 <math>\begin{matrix} +130\mu\text{A} \\ -80\mu\text{A} \end{matrix}</math> (MED position)</p> <p>330 <math>\begin{matrix} +130\mu\text{A} \\ -80\mu\text{A} \end{matrix}</math> (HIGH position)</p> </div> <ol style="list-style-type: none"> <li>Adjust L5 (L-CH) and L6 (R-CH) (See adjustment part location on page 12).</li> </ol> | * Record mode<br>* When bias current is the adjusted on one channel only, note that bias current on the other channel may vary.<br>* When L5 or L6 is the replaced, preset core position to bottom side of coil and then readjust optimum bias current. |
| <b>Erase current</b><br>Equipment:<br>* VTVM<br>* Oscilloscope<br>* Resistor (0.1Ω)                               | <ol style="list-style-type: none"> <li>Connect 0.1Ω resistor between ground side terminal of erase head ground lead wire removed (See fig. 21).</li> <li>Connect VTVM to both ends of 0.1Ω resistor.</li> </ol>  <p style="text-align: center;"><b>Fig. 20</b></p>  <p style="text-align: center;"><b>Fig. 21</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | * Record mode                                                                                                                                                                                                                                           |

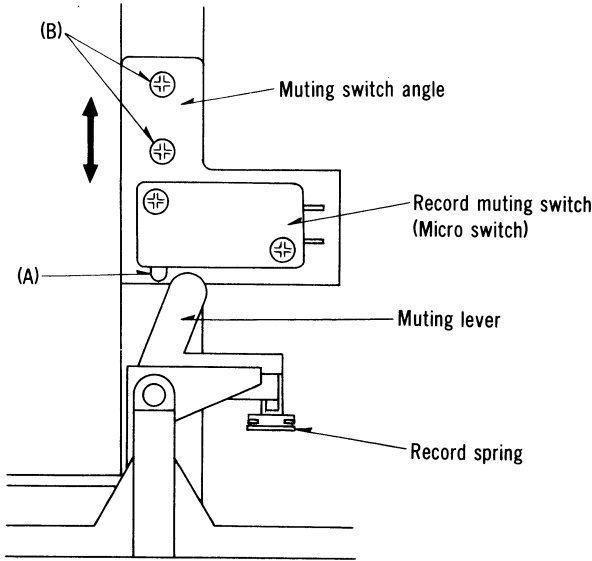
| ITEM                                                                                                                                                                                                                                        | MEASUREMENT & ADJUSTMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | REMARKS                                                                                                                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                             | <p>3. Place UNIT into record mode, and measure voltage across the <math>0.1\Omega</math> resistor.</p> <p>4. Determine erase current with the following formula:</p> $\text{Erase current (A)} = \frac{\text{Voltage across both ends of } 0.1\Omega}{0.1\Omega}$ <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p><b>Standard value:</b><br/> <math>70 \pm 33\text{mA}</math> (LOW position)<br/> <math>80 \pm 33\text{mA}</math> (MED position)<br/> <math>90 \pm 33\text{mA}</math> (HIGH position)</p> </div>                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                  |
| <p><b>Overall gain</b></p> <p>Equipment:</p> <ul style="list-style-type: none"> <li>* AF oscillator</li> <li>* VTVM</li> <li>* ATT</li> <li>* Oscilloscope</li> <li>* Test tape (reference blank tape)<br/>... QZZCRA for Normal</li> </ul> | <p>1. Test equipment connection is shown in fig. 22.</p>  <p style="text-align: center;"><b>Fig. 22</b></p> <p>2. Place UNIT into record mode, and equalizer selector to <math>120\mu\text{S}</math>, bias selector to LOW (for normal tape).</p> <p>3. Supply 1 kHz signal (<math>-24\text{dB}</math>) from AF oscillator, through ATT, to LINE IN.</p> <p>4. Adjust ATT until monitor level at LINE OUT becomes <math>0.42\text{V}</math> (<math>-7\text{dB}</math>).</p> <p>5. Using test tape, make recording.</p> <p>6. Playback recorded tape, and make sure the value at LINE OUT on VTVM becomes <math>0.42\text{V}</math>.</p> <p>7. If measured value is not <math>0.42\text{V}</math>, adjust VR11 (L-CH), VR12 (R-CH) (See fig. 28 on page 12).</p> <p>8. Repeat from step (2).</p> | <ul style="list-style-type: none"> <li>* Record/playback mode</li> <li>* LINE IN level control<br/>... MAX</li> <li>* Standard input level:<br/> MIC... <math>-72 \pm 3\text{dB}</math><br/> LINE IN ... <math>-24 \pm 3\text{dB}</math><br/> DIN... <math>-36 \pm 3\text{dB}</math> </li> </ul> |
| <p><b>Level meter</b></p> <p>Equipment:</p> <ul style="list-style-type: none"> <li>* VTVM</li> <li>* Oscilloscope</li> <li>* AF oscillator</li> <li>* ATT</li> </ul>                                                                        | <p>1. Test equipment connection is shown in fig. 23.</p>  <p style="text-align: center;"><b>Fig. 23</b></p> <p>2. Supply 1 kHz signal from the AF oscillator, through the ATT, to the LINE IN jack.</p> <p>3. Adjust ATT so that the monitor level at LINE OUT becomes <math>0.42\text{V}</math>.</p> <p>4. Adjust VR9 (L-CH) and VR10 (R-CH) so that the level meters indicate <math>0\text{dB}</math>.</p>                                                                                                                                                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>* Record mode</li> <li>* LINE IN level control<br/>... MAX</li> </ul>                                                                                                                                                                                     |

| ITEM                                                                                                                                                                                                             | MEASUREMENT & ADJUSTMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | REMARKS                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| <b>Overall distortion</b><br>Equipment:<br>* Distortion meter<br>* AF oscillator<br>* ATT<br>* Oscilloscope<br>* Test tape<br>(reference blank tape)<br>... QZZCRA for Normal<br>... QZZCRX for CrO <sub>2</sub> | <p>1. Test equipment connection is shown in fig. 24.</p>  <p style="text-align: center;"><b>Fig. 24</b></p> <p>2. Supply 1 kHz signal to LINE IN and adjust ATT so that output level at LINE OUT indicates 0.42 V (−7 dB).</p> <p>3. Make recording.</p> <p>4. Playback and measure distortion factor of output signal.</p> <p>5. When the distortion factor does not satisfy the standard, check the bias current. When the bias current is lower than standard, distortion will increase.</p> <p>Care should be exercised in the adjustment because the bias current also has an influence on the overall frequency response. Refer to "The overall frequency response" and "The bias current adjustment".</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p><b>Standard value:</b><br/>         Less than 2.3% (Normal)<br/>         Less than 3.3% (CrO<sub>2</sub>)</p> </div>                                                                                                                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>* Record/playback mode</li> <li>* LINE IN level control<br/>    ... MAX</li> </ul> |
| <b>Overall frequency response</b><br>Equipment:<br>* VTVM<br>* AF oscillator<br>* ATT<br>* Test tape<br>(reference blank tape)<br>... QZZCRA for Normal<br>... QZZCRX for CrO <sub>2</sub>                       | <p><b>Note:</b><br/>           Before measuring, and adjusting, make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response).</p> <ol style="list-style-type: none"> <li>Test equipment connection is shown in fig. 22.</li> <li>Load reference blank test tape and place UNIT into record mode.</li> <li>Supply 1 kHz signal from AF oscillator through ATT to LINE IN.</li> <li>Adjust ATT so that input level is −20 dB below standard recording level (standard recording level = 0 VU).</li> <li>Record each frequency 50 Hz, 100 Hz, 200 Hz, 1 kHz, 2 kHz, 4 kHz and 11 kHz (12 kHz for CrO<sub>2</sub> tape) at the same level.</li> <li>Playback and express in dB the difference between playback output level of each frequency based on playback output level of 1 kHz.</li> <li>Make sure that the measured value is within the range specified in the overall frequency response chart.</li> </ol> <p style="text-align: center;"><b>Overall frequency response chart (Normal)</b></p>  <p style="text-align: center;"><b>Fig. 25</b></p> <ol style="list-style-type: none"> <li>Set the bias and equalizer selector to CrO<sub>2</sub> position.</li> <li>Measure as same as manner above.</li> </ol> | <ul style="list-style-type: none"> <li>* Record/playback mode</li> <li>* LINE IN level control<br/>    ... MAX</li> </ul> |

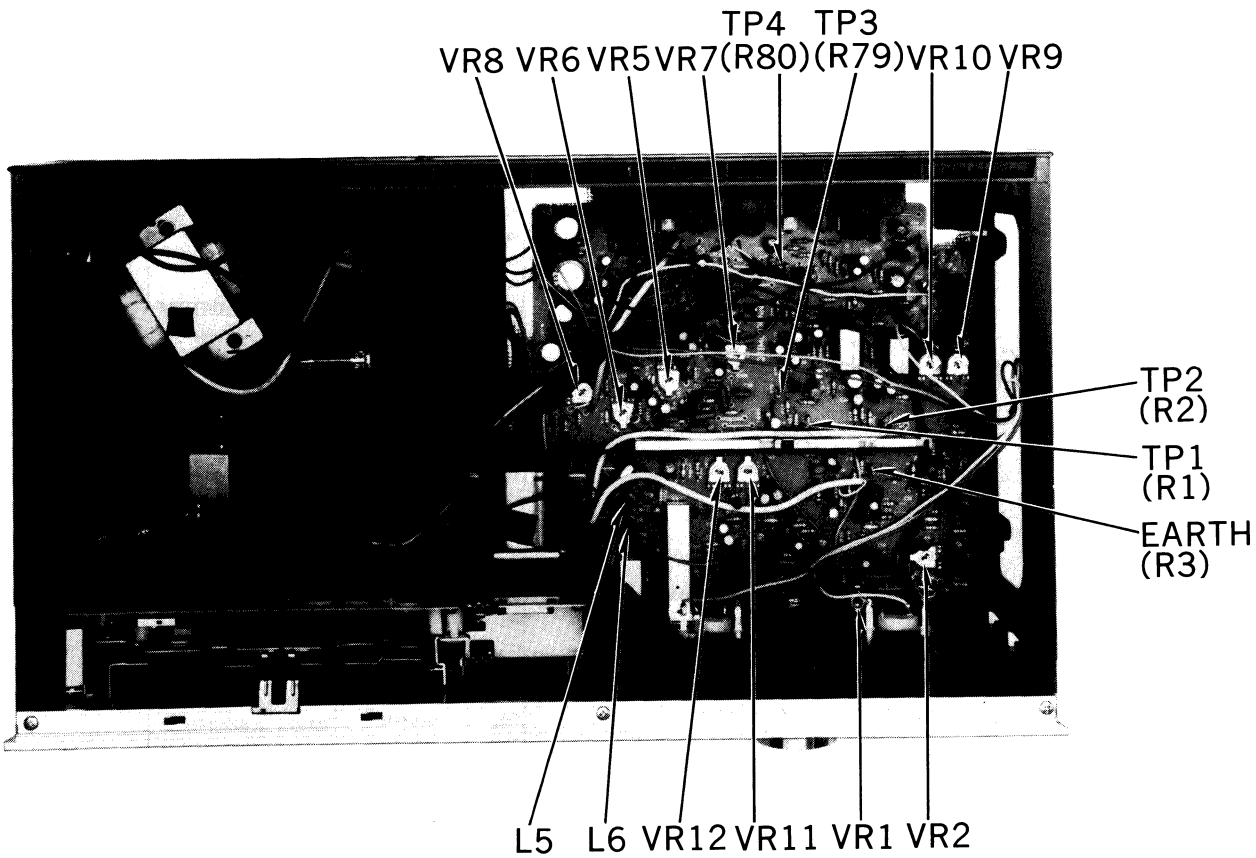
| ITEM                                                                                                                                                  | MEASUREMENT & ADJUSTMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | REMARKS                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                       | <p>11. Make sure that the measured value is within the range specified in the overall frequency response chart for CrO<sub>2</sub> tape below.</p> <p style="text-align: center;"><b>Overall frequency response chart (CrO<sub>2</sub>)</b></p>  <p style="text-align: center;"><b>Fig. 26</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                         |
| <b>Overall frequency response adjustment</b><br>(As a standard for adjustment)                                                                        | <p>1. When the frequency response between the middle and high-frequency range becomes higher than the standard value, as shown by the solid line in fig. 27, increase the bias current by turning L5 (L-CH), L6 (R-CH).</p> <p>2. When it becomes lower, as shown by dotted line, reduce the bias current by turning L5 (L-CH), L6 (R-CH).</p> <p><b>Note:</b><br/>         For the method of bias current measurement, refer to "Bias current adjustment" on page 8.</p>  <p style="text-align: center;"><b>Fig. 27</b></p>                                                                                                                                                                                                                  |                                                                                                                                                                                                                         |
| <b>Dolby NR circuit</b><br>Equipment:<br>* VTVM<br>* AF oscillator<br>* ATT<br>* Oscilloscope                                                         | <ol style="list-style-type: none"> <li>Place UNIT into record mode, set the Dolby NR switch to OUT position and supply to LINE IN to obtain -34.5dB at TP3 (L-CH), TP4 (R-CH) (frequency 5kHz).</li> <li>Confirm that the value at IN position is 8dB greater than the value at OUT position of Dolby NR switch.</li> <li>When it is not in condition above, adjust as follows.</li> <li>Set VR5 (L-CH), VR6 (R-CH) to maximum.</li> <li>Set the Dolby NR switch to IN position.</li> <li>At this time adjust VR7 (L-CH), VR8 (R-CH) so that the reading of VTVM become 10dB greater than the value in step (1) above.</li> <li>Adjusting VR5 (L-CH), VR6 (R-CH), make the reading of VTVM become 2dB smaller than the value obtained through the adjustment a in step (6) above.</li> </ol>                                     | <ul style="list-style-type: none"> <li>* Record mode</li> <li>* LINE IN level control<br/>...MAX</li> <li>* Stop the bias oscillation by unsoldering point (D) shown in adjustment parts location on page 7.</li> </ul> |
| <b>Overall S/N ratio</b><br>Equipment:<br>* VTVM<br>* AF oscillator<br>* ATT<br>* Oscilloscope<br>* Test tape<br>(reference blank tape)<br>... QZZCRA | <ol style="list-style-type: none"> <li>Test equipment connection is shown in fig. 22.</li> <li>Supply 1kHz signal to LINE IN and adjust ATT so that output level at LINE OUT indicates 0.42V (-7dB).</li> <li>Make recording.</li> <li>Make another recording without supplying signal (disconnect input plug to LINE IN).</li> <li>Rewind to recorded part and playback.</li> <li>Measure output signal level and no signal level (noise), and determine the ratio in decibels (dB).</li> <li>The value is difference between "Playback S/N and overall S/N", but for decibel calculation refer to "Playback S/N measurement" on page 8.</li> </ol> <div style="border: 1px solid black; padding: 5px; margin-top: 10px; text-align: center;"> <b>Standard value:</b><br/> <b>Greater than 42dB (without NAB filter)</b> </div> | <ul style="list-style-type: none"> <li>* Record/playback mode</li> <li>* LINE IN level control<br/>...MAX</li> <li>* Erase the tape with a bulk tape eraser.</li> </ul>                                                 |

HOW TO INSTALL THE RECORD-MUTING SWITCH

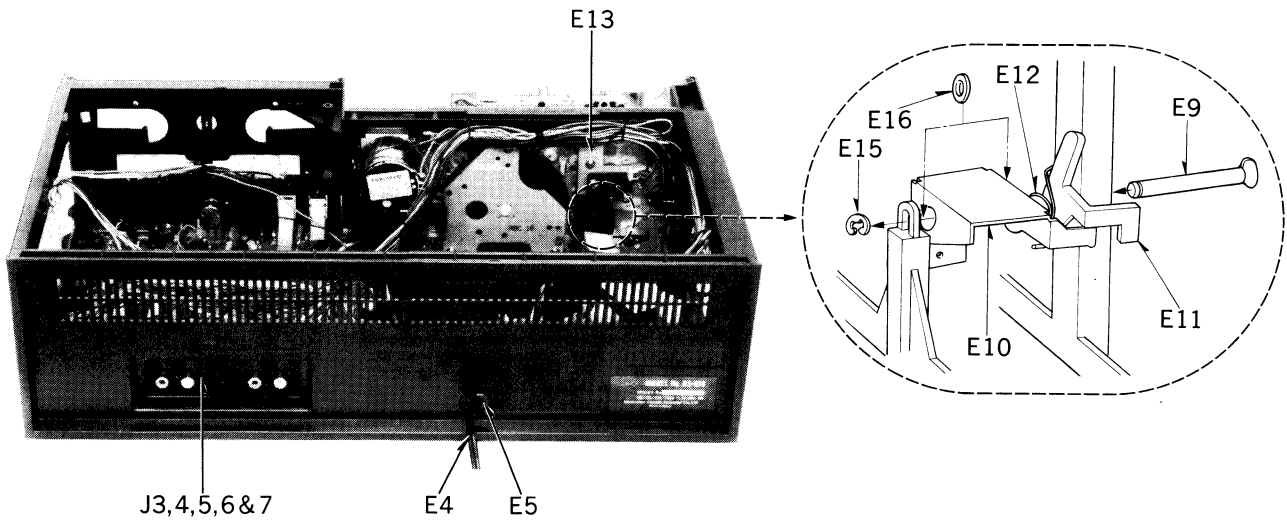
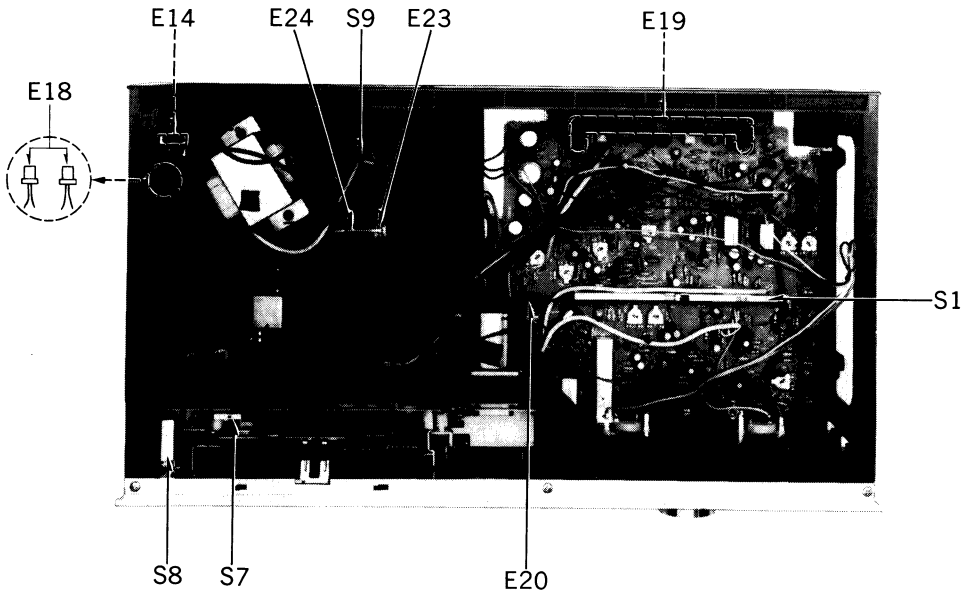
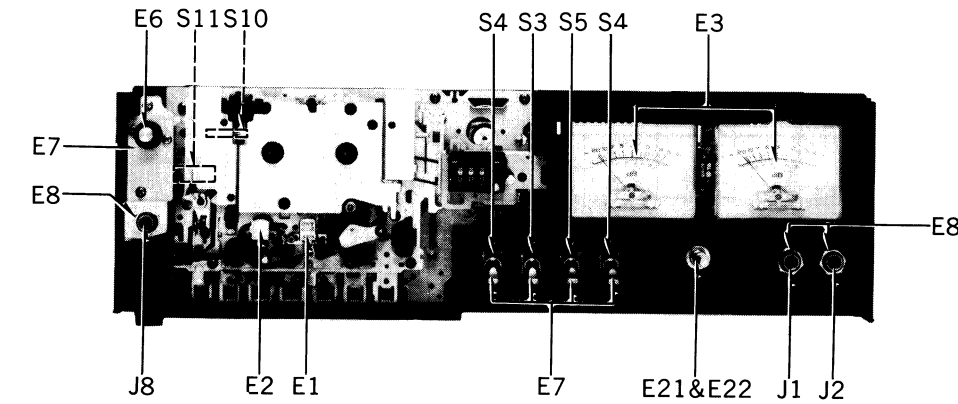
- 1. Lock the record button, and then mount it with screw (B) so that the cap and micro switch (A) do not contact each other.
- 2. Then play the music tape. Durring the playback, press the record button lightly several times, confirm whether the playback sound is interrupted or not.



ADJUSTMENT PARTS LOCATION



ELECTRICAL PARTS LOCATION



NOTE: **S** indicates that only parts specified by the manufacturer be used for safety.

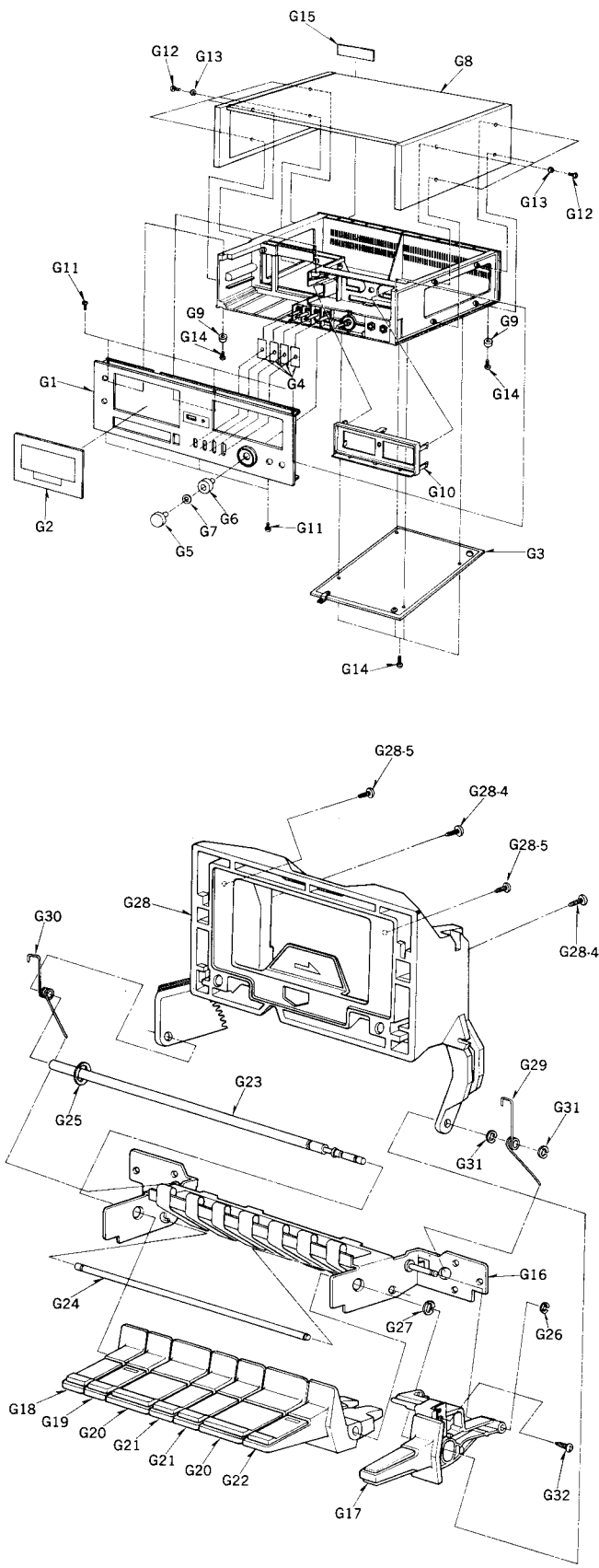
| Ref. No.                | Part No.   | Part Name & Description     |
|-------------------------|------------|-----------------------------|
| <b>ELECTRICAL PARTS</b> |            |                             |
| E1                      | QWY4113Z   | Record/Playback Head        |
| E2                      | QWY2122ZA  | Erase Head                  |
| E3                      | QSL1092RNM | Level Meter with Pilot Lamp |
| E4                      | QFC1203M   | AC Power Cord               |
| E5                      | QTD1129    | Power Cord Bushing          |
| E6                      | QXBM0018   | Push Button (Power Switch)  |
| E7                      | QMAM0083   | Power Switch Angle          |
| E8                      | QNQ1070    | Nut                         |
| E9                      | QMS1236    | Record Lever Shaft          |
| E10                     | QMLM0033   | Record Lever                |
| E11                     | QMLM0034   | Muting Lever                |
| E12                     | QBN1621    | Muting Lever Spring         |
| E13                     | QMFM0007   | Muting Switch Angle         |
| E14                     | QTSM0020   | Earth Metal                 |
| E15                     | XUC3FT     | Stop Ring $\phi 3$          |
| E16                     | QBK7005    | Washer                      |
| E18                     | QJT1029    | Connection Terminal         |
| E19                     | QKJM0017   | Jack Cover Plate            |
| E20                     | QBSM0001   | Recording Connection Wire   |
| E21                     | XWG9D15AW  | Washer for Volume           |
| E22                     | QNQ1039    | Nut for Volume              |
| E23                     | QTF1056    | Fuse Holder                 |
| E24                     | XBA2E03NS5 | Fuse (0.3A)                 |

H

1.

2.

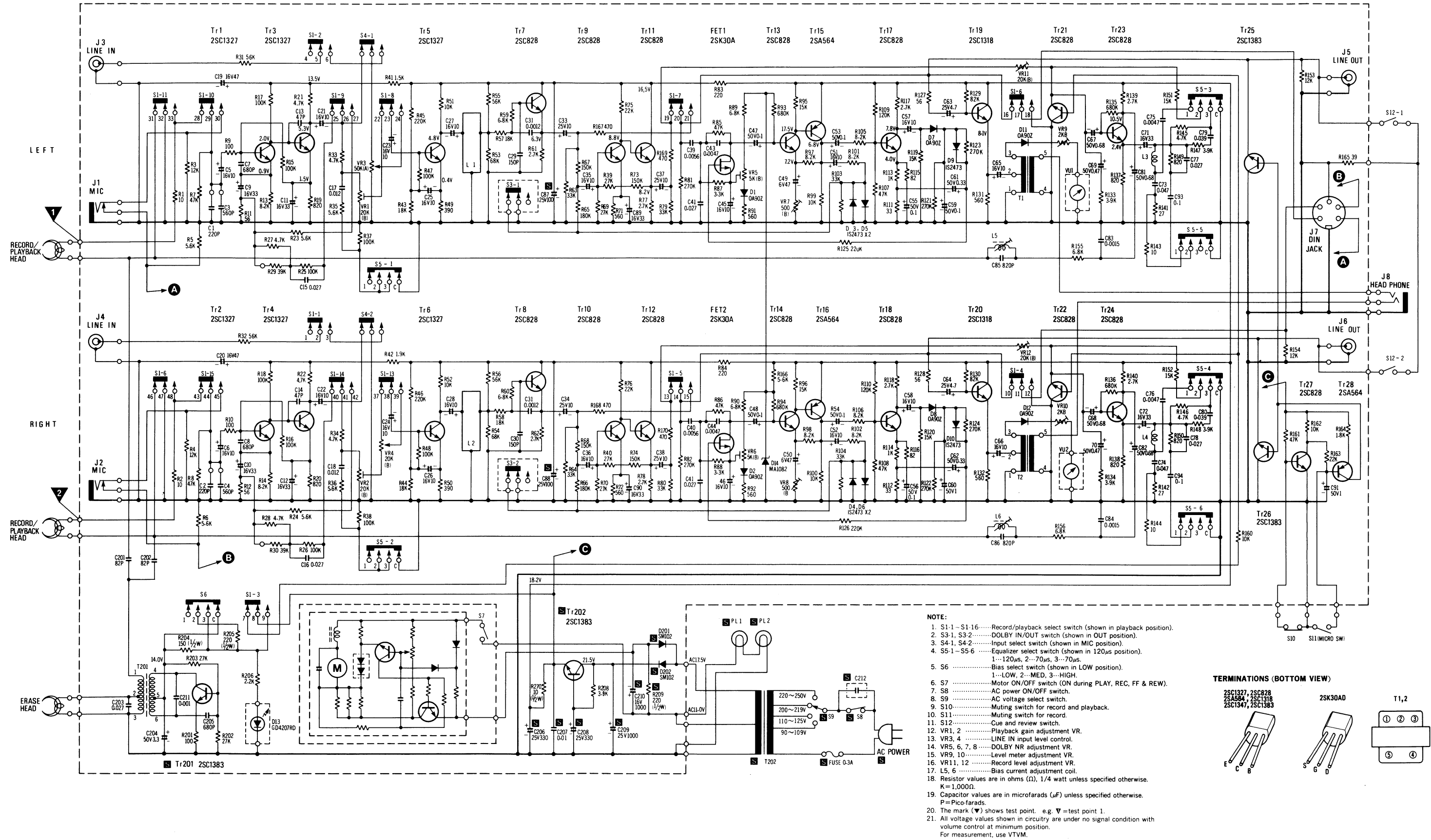
# CABINET PARTS



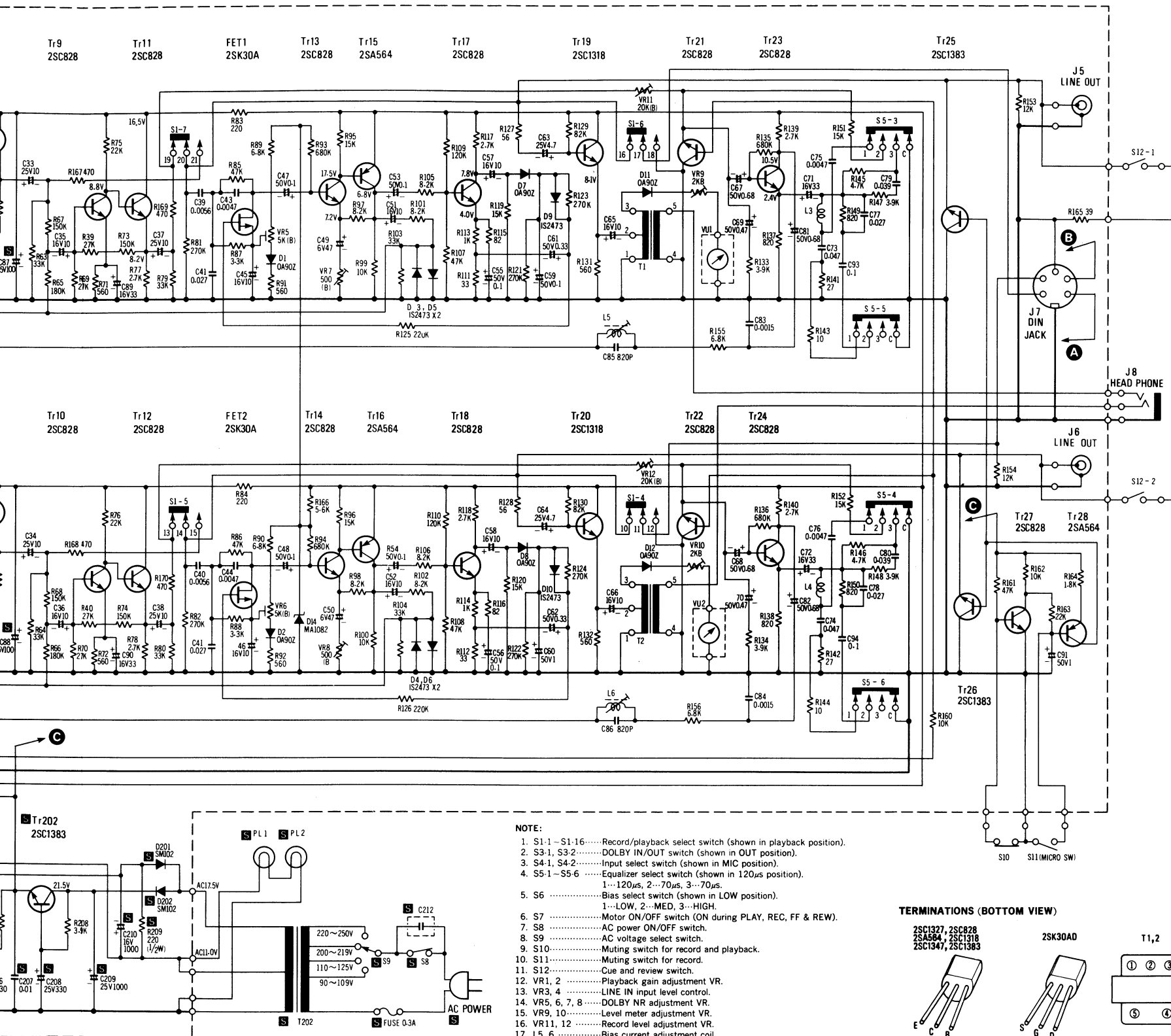
NOTE: ■ indicates that only parts specified by the manufacturer be used for safety.

| Ref. No.             | Part No.     | Part Name & Description                  |
|----------------------|--------------|------------------------------------------|
| <b>CABINET PARTS</b> |              |                                          |
| G1                   | QYPM0025     | Front Panel Assembly                     |
| G2                   | QYFM0031     | Cassette Lid Assembly                    |
| G3                   | QYCM0020     | Bottom Board Assembly                    |
| G4                   | QBH2021S     | Switch Shelter                           |
| G5                   | QYT0458      | Volume Knob-1                            |
| G6                   | QYT0457      | Volume Knob-2                            |
| G7                   | QBW2066      | Volume Washer                            |
| G8                   | QYWM0010     | Wooden Case Cover                        |
| G9                   | QKA1050      | Rubber Foot                              |
| G10                  | QYKM0001     | Level Meter Cover Assembly               |
| G11                  | XTN3+8B      | Tapping Screw $\Phi 3 \times 8$          |
| G12                  | XTN4+20B     | Tapping Screw $\Phi 4 \times 20$ (Black) |
| G13                  | XWG4E10FZ    | Washer (Black)                           |
| G14                  | XTN3+10B     | Tapping Screw $\Phi 3 \times 10$         |
| G15                  | QGSM0087     | Name Plate                               |
| G16                  | QXA0669      | Push Button Holding Angle                |
| G17                  | QXB0556      | Timer Button Assembly                    |
| G18                  | QGO1473      | Pause Button                             |
| G19                  | QGO1474      | Record Button                            |
| G20                  | QGO1476      | Button (Playback, Stop)                  |
| G21                  | QGO1477      | Button (FF, REW)                         |
| G22                  | QGO1475      | Eject Button                             |
| G23                  | QMN2240      | Bush Button Shaft-A                      |
| G24                  | QMN1861      | Bush Button Shaft-B                      |
| G25                  | QNQ1080      | Stop Ring                                |
| G26                  | XUC25FT      | Stop Ring $\phi 2.5$                     |
| G27                  | XUC4FT       | Stop Ring $\phi 4$                       |
| G28                  | QYFM0029     | Cassette Holder Assembly                 |
| G28-4                | XTN26+8B     | Tapping Screw $\Phi 2.6 \times 8$        |
| G28-5                | XTN26+6B     | Tapping Screw $\Phi 2.6 \times 6$        |
| G29                  | QBN1622      | Lid Spring 1                             |
| G30                  | QBN1623      | Lid Spring 2                             |
| G31                  | XUC3FT       | Stop Ring $\phi 3$                       |
| G32                  | XTN26+5B     | Tapping Screw $\Phi 2.6 \times 5$        |
| G33                  | QYMM0047     | Main Case Assembly                       |
| <b>ACCESSORIES</b>   |              |                                          |
| A1                   | RP023A       | Connection Cord-G                        |
| A2                   | QFT1TCCPTRJZ | Demonstration Tape                       |
| A3                   | ■ XBA2E03NS5 | Fuse (0.3A)                              |
| A4                   | QQT2302      | Instruction Book                         |
| <b>PACKINGS</b>      |              |                                          |
| P1                   | QPNM0120     | Inside Carton                            |
| P2                   | QPAM0024     | Inner Carton                             |
| P3                   | XZB50X65A02  | Poly Bag                                 |

# SCHEMATIC DIAGRAM MODEL RS-616



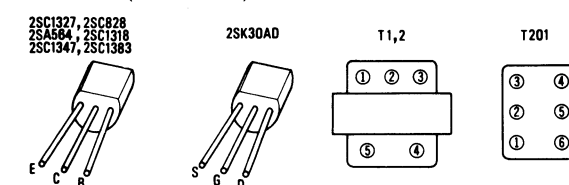
NOTE: RESISTORS ERD .....Carbon  
ERG .....Metal oxide  
CAPACITORS ECEA .....Electrolytic  
ECCD .....Ceramic  
ECKD .....Ceramic  
EQCM .....Polystyrene  
EQCS .....Polystyrene



#### NOTE:

- S1-1 ~ S1-16 .....Record/playback select switch (shown in playback position).
- S3-1, S3-2 .....DOLBY IN/OUT switch (shown in OUT position).
- S4-1, S4-2 .....Input select switch (shown in MIC position).
- S5-1 ~ S5-6 .....Equalizer select switch (shown in 120μs position).  
1...120μs, 2...70μs, 3...70μs.
- S6 .....Bias select switch (shown in LOW position).  
1...LOW, 2...MED, 3...HIGH.
- S7 .....Motor ON/OFF switch (ON during PLAY, REC, FF & REW).
- S8 .....AC power ON/OFF switch.
- S9 .....AC voltage select switch.
- S10 .....Muting switch for record and playback.
- S11 .....Muting switch for record.
- S12 .....Cue and review switch.
- VR1, 2 .....Playback gain adjustment VR.
- VR3, 4 .....LINE IN input level control.
- VR5, 6, 7, 8 .....DOLBY NR adjustment VR.
- VR9, 10 .....Level meter adjustment VR.
- VR11, 12 .....Record level adjustment VR.
- L5, 6 .....Bias current adjustment coil.
- Resistor values are in ohms (Ω), 1/4 watt unless specified otherwise.  
K = 1,000Ω.
- Capacitor values are in microfarads (μF) unless specified otherwise.  
P = Pico-farads.
- The mark (▼) shows test point. e.g. ▼ = test point 1.
- All voltage values shown in circuitry are under no signal condition with volume control at minimum position.  
For measurement, use VTVM.

#### TERMINATIONS (BOTTOM VIEW)

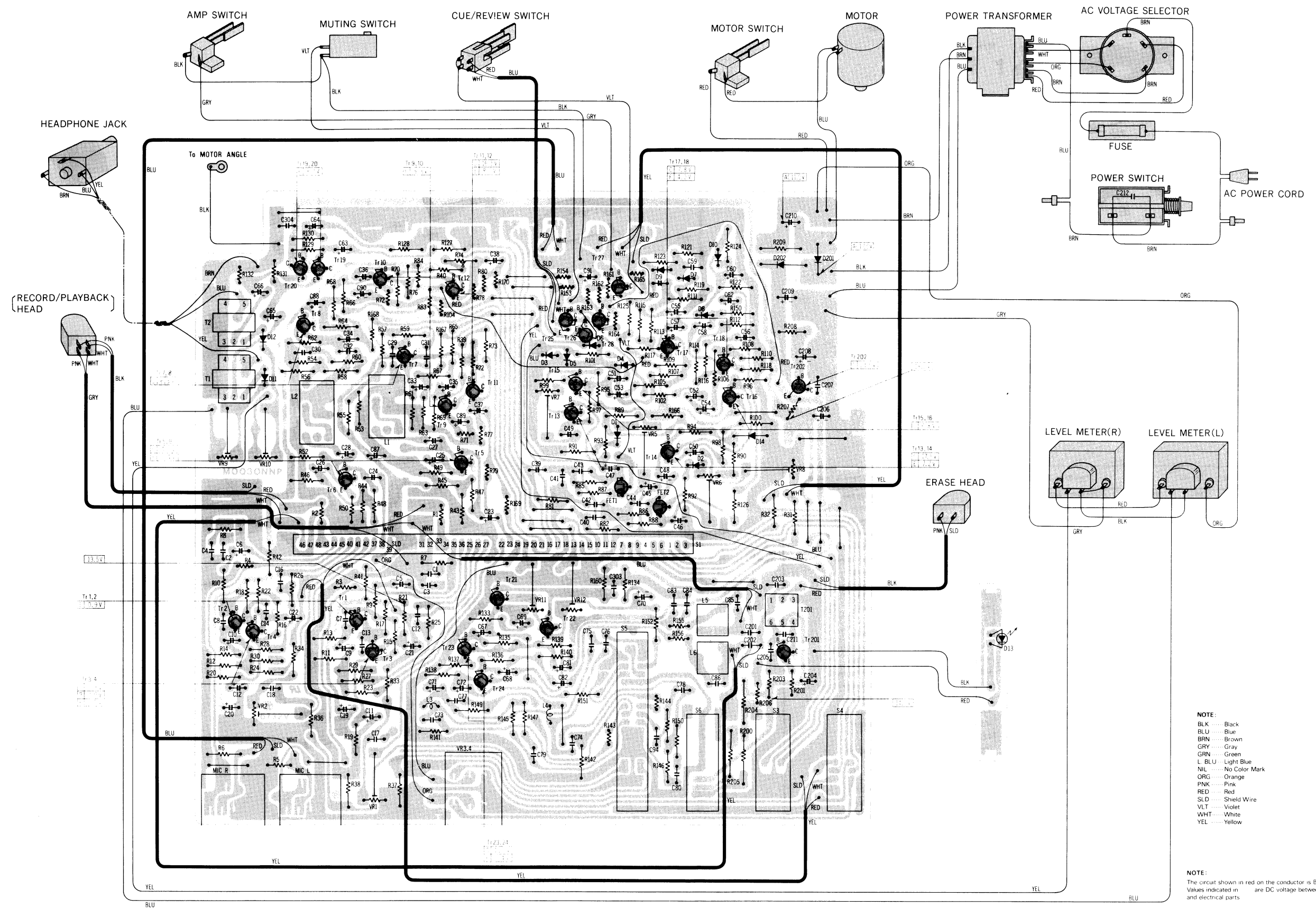


NOTE: ■ indicates that only parts specified by the manufacturer be used for safety.

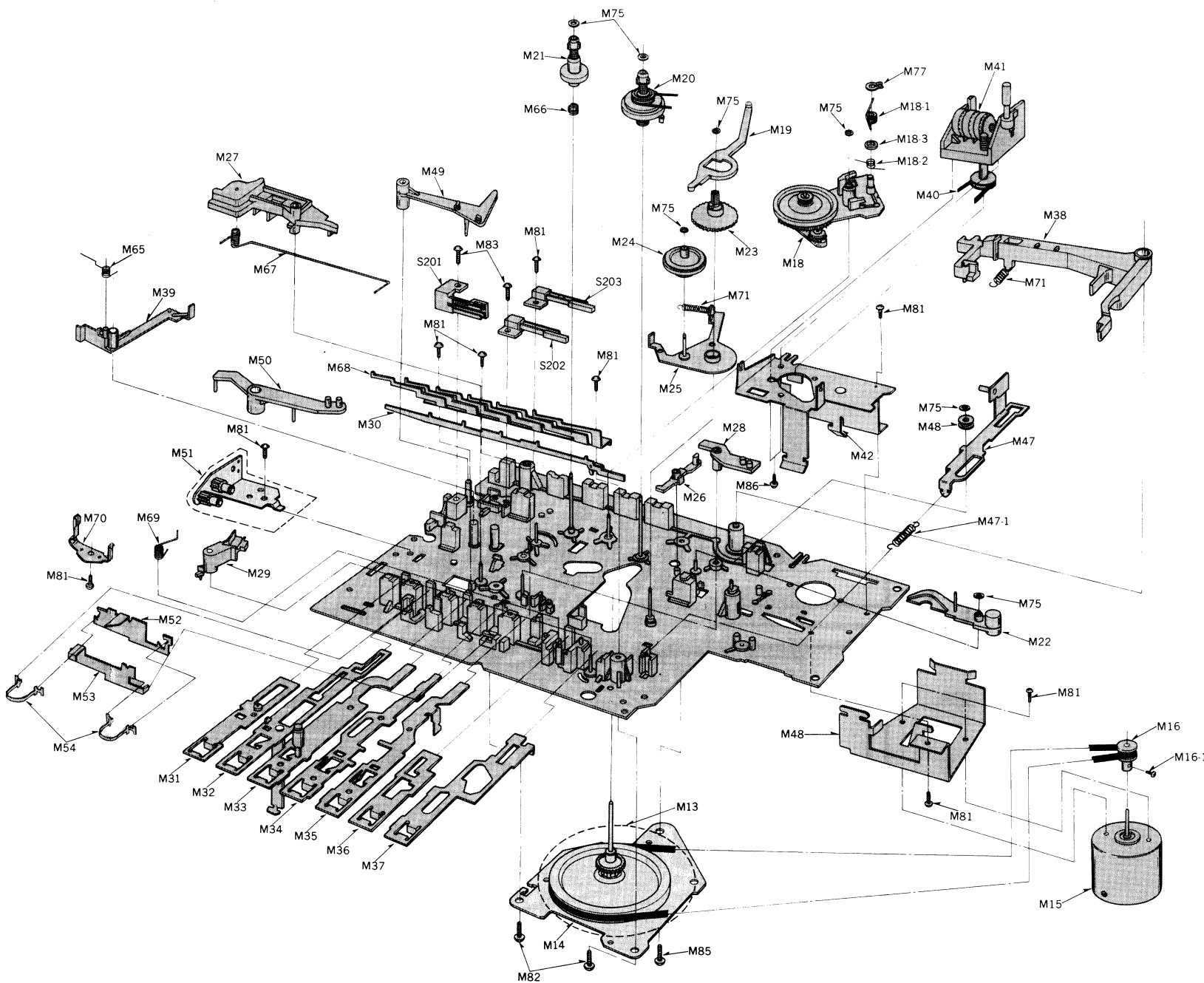
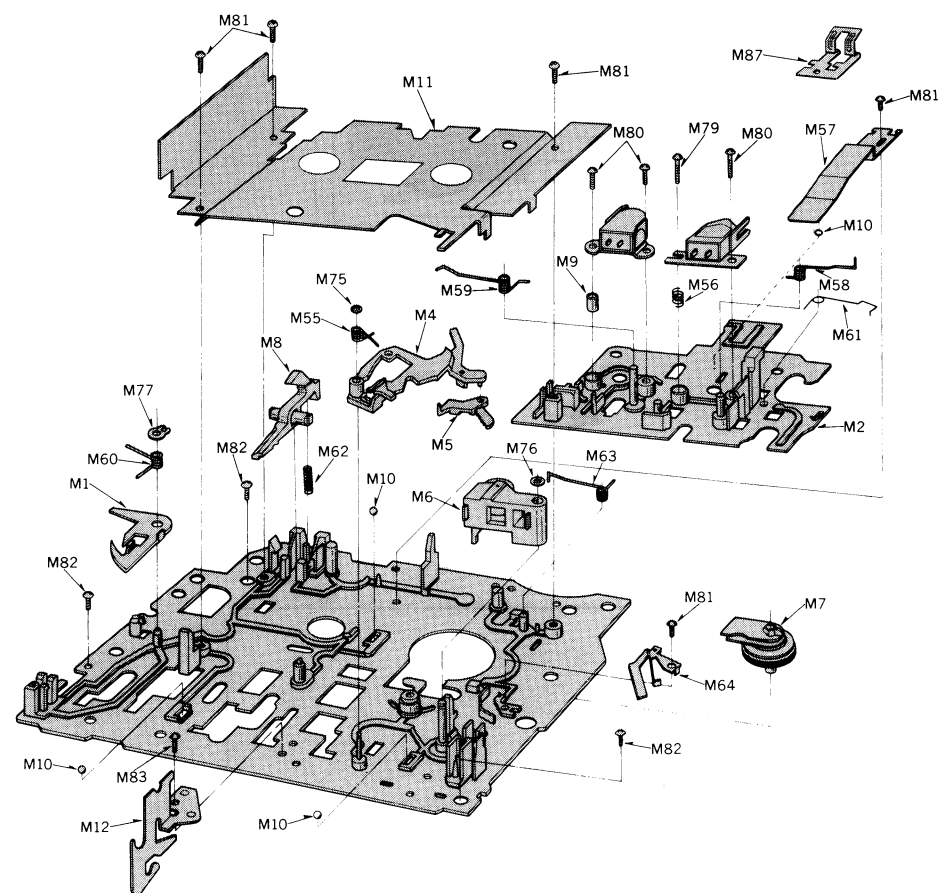
| Ref. No.                       | Part No.  | Part Name & Description                   |
|--------------------------------|-----------|-------------------------------------------|
| <b>TRANSISTORS</b>             |           |                                           |
| Tr1, 2, 3, 4, 5, 6             | 2SC1327   | Transistor                                |
| Tr7, 8, 9, 10, 11, 12, 13, 14  | 2SC828    | "                                         |
| Tr15, 16                       | 2SA564    | "                                         |
| Tr17, 18                       | 2SC828    | "                                         |
| Tr19, 20                       | 2SC1318   | Transistor                                |
| Tr21, 22, 23, 24               | 2SC828    | "                                         |
| Tr25, 26                       | 2SC1383   | "                                         |
| Tr27                           | 2SC828    | "                                         |
| Tr28                           | 2SA564    | "                                         |
| Tr201, 202                     | 2SC1383   | "                                         |
| <b>FET</b>                     |           |                                           |
| FET1, 2                        | 2SK30AD   | FET                                       |
| <b>DIODES &amp; RECTIFIERS</b> |           |                                           |
| D1, 2                          | OA90Z     | Diode                                     |
| D3, 4, 5, 6                    | 1S2473    | "                                         |
| D7, 8                          | OA90Z     | "                                         |
| D9, 10                         | 1S2473    | "                                         |
| D11, 12                        | OA90Z     | "                                         |
| D13                            | GD4207RD  | Light Emitting Diode                      |
| D14                            | MA1082    | Diode                                     |
| D201, 202                      | SM102     | Rectifier                                 |
| <b>TRANSFORMERS</b>            |           |                                           |
| T1, 2                          | QLT2D26X  | Headphone Transformer                     |
| T201                           | QLB0158   | Bias OSC Transformer                      |
| T202                           | QLPZ9ELX  | Power Transformer                         |
| <b>COILS</b>                   |           |                                           |
| L1, 2                          | QLM925K   | MPX Filter                                |
| L3, 4                          | QLQX2421Y | Record EQ Coil                            |
| L5, 6                          | QLQX1032W | Bias Trap Coil                            |
| <b>SWITCHES</b>                |           |                                           |
| S1                             | QSSG206F  | Slide Switch (Record/Playback Selector)   |
| S3, 4                          | QES1383   | Lever Switch (DOLBY IN/OUT, Input Select) |
| S5                             | QES1382   | Lever Switch (EQ Select)                  |
| S6                             | QES1441H  | Lever Switch (Bias Select)                |
| S7                             | QSB0178   | Leaf Switch (Motor ON/OFF)                |
| S8                             | ESB70124  | Push Switch (Power ON/OFF)                |
| S9                             | QSR1407   | Rotary Switch (AC Voltage Selector)       |
| S10                            | QSB0178   | Leaf Switch (Muting)                      |
| S11                            | QSM0070   | Micro Switch (Muting)                     |
| S12                            | QSB0186   | Leaf Switch (Cue and Review)              |
| <b>JACKS</b>                   |           |                                           |
| J1, 2                          | QJA0256H  | TMS Jack (MIC)                            |
| J3, 4, 5, 6, 7                 | QEJ5002H  | Line IN/OUT & DIN Jack Assembly           |
| J8                             | QJA0255H  | TMS Jack (PHONES)                         |

| Ref. No.         | Part No.   | Ref. No.                        | Part No.     | Ref. No.  | Part No.    |
|------------------|------------|---------------------------------|--------------|-----------|-------------|
| <b>RESISTORS</b> |            |                                 |              |           |             |
| R1, 2            | ERD25TJ100 | R121, 122, 123, 124             | ERD25TJ274   | C43, 44   | EQCM05472JZ |
| R3, 4            | ERD25TJ123 | R125, 126                       | ERD25TJ224   | C45, 46   | ECEA1HS100  |
| R5, 6            | ERD25TJ562 | R127, 128                       | ERD25TJ560   | C47, 48   | ECEA50MR1R  |
| R7, 8            | ERD25TJ473 | R129, 130                       | ERD25TJ823   | C49, 50   | ECEA1AS470  |
| R9, 10           | ERD25TJ101 | R131, 132                       | ERD25TJ561   | C51, 52   | ECEA1HS100  |
| R11, 12          | ERD25TJ560 | R133, 134                       | ERD25TJ392   | C53, 54   | ECEA50Z1R   |
| R13, 14          | ERD25TJ822 | R135, 136                       | ERD25TJ821   | C57, 58   | ECEA1HS100  |
| R15, 16          | ERD25TJ104 | R137, 138                       | ERD25TJ821   | C59, 60   | ECEA50Z1R   |
| R17, 18          | ERD25TJ104 | R139, 140                       | ERD25TJ272   | C61, 62   | ECEA50Z3R3  |
| R19, 20          | ERD25TJ821 | R141, 142                       | ERD25TJ270   | C63, 64   | ECEA1J54R7  |
| R21, 22          | ERD25TJ472 | R143, 144                       | ERD25TJ100   | C65, 66   | ECEA1HS100  |
| R23, 24          | ERD25TJ562 | R145, 146                       | ERD25TJ472   | C67, 68   | ECEA50Z6R8  |
| R25, 26          | ERD25TJ104 | R147, 148                       | ERD25TJ392   | C69, 70   | ECEA1CS330  |
| R27, 28          | ERD25TJ472 | R149, 150                       | ERD25TJ821   | C71, 72   | EQCM05473KZ |
| R29, 30          | ERD25TJ393 | R151, 152                       | ERD25TJ153   | C73, 74   | EQCM05472KZ |
| R31, 32          | ERD25TJ563 | R153, 154                       | ERD25TJ123   | C75, 76   | EQCM05273KZ |
| R33, 34          | ERD25TJ472 | R155, 156                       | ERD25TJ682   | C77, 78   | EQCM05393KZ |
| R35, 36          | ERD25TJ562 | R160                            | ERD25TJ103   | C79, 80   | ECEA50Z6R8  |
| R37, 38          | ERD25TJ104 | R161                            | ERD25TJ473   | C81, 82   | ECKD1H152K  |
| R39, 40          | ERD25TJ273 | R162                            | ERD25TJ103   | C83, 84   | EQCS1821KZ  |
| R41, 42          | ERD25TJ152 | R163                            | ERD25TJ223   | C85, 86   | ECEA1ES101  |
| R43, 44          | ERD25TJ183 | R164                            | ERD25TJ182   | C87, 88   | ECEA1ES101  |
| R45, 46          | ERD25TJ224 | R165                            | ERD25TJ390   | C89, 90   | ECEA1CS330  |
| R47, 48          | ERD25TJ104 | R166                            | ERD25TJ562   | C91       | ECEA2AS010  |
| R49, 50          | ERD25TJ391 | R167, 168                       | ERD25TJ471   | C93, 94   | EQCM05104KZ |
| R51, 52          | ERD25TJ103 | R169, 170                       | ERD25TJ471   | C201, 202 | ECCD1H820K  |
| R53, 54          | ERD25TJ683 | R201                            | ERD25TJ101   | C203      | EQCM1273KZ  |
| R55, 56          | ERD25TJ563 | R202, 203                       | ERD25TJ273   | C204      | ECEA2AS3R3  |
| R57, 58          | ERD25TJ183 | R204                            | ERD50TJ151   | C205      | EQCS1681KZ  |
| R59, 60          | ERD25TJ682 | R205                            | ERD50TJ221   | C206      | ECEA1ES331  |
| R61, 62          | ERD25TJ272 | R206                            | ERD25TJ222   | C207      | ECEA1ES331  |
| R63, 64          | ERD25TJ333 | R207                            | ERD50TJ100   | C208      | ECEA1ES331  |
| R65, 66          | ERD25TJ184 | R208                            | ERD25TJ392   | C209      | ECEA1VS102  |
| R67, 68          | ERD25TJ154 | R209                            | ERD50TJ221   | C210      | ECEA1CS102  |
| R69, 70          | ERD25TJ273 | R209                            | ERD50TJ221   | C211      | ECKD1H102K  |
| R71, 72          | ERD25TJ561 | R209                            | ERD50TJ221   | C212      | EQCM6223KZ  |
| R73, 74          | ERD25TJ154 | VR1, 2                          | EVL33AA00B24 |           |             |
| R75, 76          | ERD25TJ223 | VR3, 4                          | EWKN3AF21A54 |           |             |
| R77, 78          | ERD25TJ272 | VR5, 6                          | EVL33AA00B53 |           |             |
| R79, 80          | ERD25TJ333 | VR7, 8                          | EVL33AA00B52 |           |             |
| R81, 82          | ERD25TJ274 | VR9, 10                         | EVL33AA00B23 |           |             |
| R83, 84          | ERD25TJ221 | VR11, 12                        | EVL33AA00B24 |           |             |
| R85, 86          | ERD25TJ473 | <b>CAPACITORS</b>               |              |           |             |
| R87, 88          | ERD25TJ332 | C1, 2                           | ECKD1H221K   |           |             |
| R89, 90          | ERD25TJ682 | C3, 4                           | ECKD1H561K   |           |             |
| R91, 92          | ERD25TJ561 | C5, 6                           | ECEA16M10R   |           |             |
| R93, 94          | ERD25TJ684 | C7, 8                           | ECKD1H681K   |           |             |
| R95, 96          | ERD25TJ153 | C9, 10, 11, 12                  | ECEA1CS330   |           |             |
| R97, 98          | ERD25TJ822 | C13, 14                         | ECCD1H470K   |           |             |
| R99, 100         | ERD25TJ103 | C15, 16                         | EQCM05273KZ  |           |             |
| R101, 102        | ERD25TJ822 | C17, 18                         | EQCM05123KZ  |           |             |
| R103, 104        | ERD25TJ333 | C19, 20                         | ECEA1ES470   |           |             |
| R105, 106        | ERD25TJ822 | C21, 22, 23, 24, 25, 26, 27, 28 | ECEA1HS100   |           |             |
| R107, 108        | ERD25TJ473 |                                 |              |           |             |
| R109, 110        | ERD25TJ124 | C29, 30                         | ECCD1H151K   |           |             |
| R111, 112        | ERD25TJ330 | C31, 32                         | ECKD1H122K   |           |             |
| R113, 114        | ERD25TJ102 | C33, 34, 35, 36, 37, 38         | ECEA1HS100   |           |             |
| R115, 116        | ERD25TJ820 |                                 |              |           |             |
| R117, 118        | ERD25TJ272 | C39, 40                         | EQCM05562JZ  |           |             |
| R119, 120        | ERD25TJ153 | C41, 42                         | EQCM05273JZ  |           |             |

# WIRING CONNECTION DIAGRAM MODEL RS-616



EXPLODED VIEWS



| Ref. No.                | Part No.  | Part Name & Description        | Ref. No. | Part No. | Part Name & Description     | Ref. No. | Part No. | Part Name & Description         |
|-------------------------|-----------|--------------------------------|----------|----------|-----------------------------|----------|----------|---------------------------------|
| <b>MECHANICAL PARTS</b> |           |                                |          |          |                             |          |          |                                 |
| M1                      | QML2898   | Pause Lock Plate               | M25      | QXL1037  | Gear Lever Assembly         | M55      | QBN1515  | Connection Spring               |
| M2                      | QMK1612   | Head Base Plate                | M26      | QML3042  | Auto-Stop Obstruction Lever | M56      | QBC1278  | Head Spring                     |
| M4                      | QML3047   | Obstruction Lever              | M27      | QML3217  | Pause Lever                 | M57      | QBP1773  | Head Base Plate Pressure Spring |
| M5                      | QML3048   | Driving Lever                  | M28      | QML3049  | Cue Lever                   | M58      | QBN1488  | Pressure Roller Spring          |
| M6                      | QXL1057   | Pressure Roller Lever Assembly | M29      | QML3124  | Lock Release Arm            | M59      | QBN1481  | Playback Spring                 |
| M7                      | QXI0098   | Takeup Idler Assembly          | M30      | QXR0275  | Lock Rod Assembly           | M60      | QBN1480  | Pause Lock Spring               |
| M8                      | QML3051   | Erase Safety Lever             | M31      | QXR0342  | Pause Rod Assembly          | M61      | QBN1514  | Timer Spring                    |
| M9                      | QMC0061   | Erase Head Spacer              | M32      | QXR0343  | Record Rod Assembly         | M62      | QBC1193  | Safety Lever Spring             |
| M10                     | QDK1012   | Steel Ball 2.5φ                | M33      | QXR0344  | Playback Rod Assembly       | M63      | QBN1513  | Idler Spring                    |
| M11                     | QXH0289   | Chassis Cover-A                | M34      | QMR1624  | Rewind Rod-A                | M64      | QBP1723  | Click Spring                    |
| M12                     | QMA3169   | Fulcrum Angle                  | M35      | QMR1623  | Fast Forward Rod-A          | M65      | QBN1574  | Brake Spring                    |
| M13                     | QXF0131   | Flywheel                       | M36      | QMR1622  | Stop Rod-A                  | M66      | QBC1279  | Back Tension Spring             |
| M14                     | QXH0272   | Flywheel Retainer Assembly     | M37      | QMR1621  | Eject Rod-A                 | M67      | QBN1555  | Pause Spring                    |
| M15                     | MHI5R9CHY | Motor                          | M38      | QML3038  | Switch Arm                  | M68      | QBP1664  | Operation Rod Spring            |
| M16                     | QXP0572   | Motor Pulley Assembly          | M39      | QML3287  | Brake Lever                 | M69      | QBN1531  | Lock Release Arm Spring         |
| M16-1                   | XSN2+3    | Screw φ2×3                     | M40      | QDB0240  | Counter Belt                | M70      | QBP1662  | Lock Rod Spring                 |
|                         |           |                                | M41※     | QXC0017  | Tape Counter                | M71      | QBT1682  | Lock Holding Spring             |
|                         |           |                                | M41※     | QXC0025  | Tape Counter                | M75      | QBW2008  | Snap Washer                     |
| M17                     | QDB0241   | Flywheel Belt                  | M42      | QMA3171  | Counter Angle               | M76      | QBW2046  | "                               |
| M18                     | QXL1136   | Fast Forward Arm Assembly      |          |          |                             | M77      | XUB4FT   | Stop Ring C4φ                   |
| M18-1                   | QBN1517   | Fast Forward Spring            | M47      | QXR0403  | Eject Rod-B                 |          |          |                                 |
| M18-2                   | QBN1559   | Fast Forward Arm Spring        | M47-1    | QBT1619  | Idler Spring                | M79      | QH01226  | Screw                           |
| M18-3                   | QMC0080   | Collar                         | M48      | QMA3414  | Motor Angle                 | M80      | XSN2+10  | Screw φ2×10                     |
| M19                     | QML3040   | Cam Lever                      | M49      | QML3206  | Muting Arm                  | M81      | XTN26+5B | Tapping Screw φ2.6×5            |
| M20                     | QXD0067   | Takeup Reel Table Assembly     | M50      | QML3207  | Muting Lever                | M82      | XTN3+10B | Tapping Screw φ3×10             |
| M21                     | QXD0084   | Supply Reel Table Assembly     | M51      | QXG1031  | Damper Gear Assembly        | M83      | XTN26+8B | Tapping Screw φ2.6×8            |
| M22                     | QXL1055   | Auto-Stop Lever Assembly       | M52      | QMR1628  | Obstruction Rod-A           | M84      | XSN26+3  | Screw φ2.6×3                    |
| M23                     | QDG1096   | Cam Gear                       | M53      | QMR1629  | Obstruction Rod-B           | M85      | XTN3+25B | Tapping Screw φ3×20             |
| M24                     | QXG1026   | Auto-Stop Gear Assembly        | M54      | QBP1770  | Obstruction Rod Spring      | M86      | XSN3+5S  | Screw φ3×5                      |
|                         |           |                                |          |          |                             | M87      | QBP1807  | Cassette Retainer Spring        |

15 “※” in indicates that QXC0017 is used for the set with marking of black paint on the counter angle.